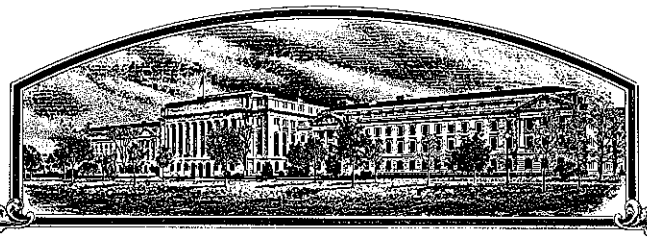

No. 9300149

# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Asgrow Seed Company

Whereas, THERE HAS BEEN PRESENTED TO THE

**Secretary of Agriculture**

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED, PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

*SOYBEAN*

*'A4539'*

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of Washington, D.C. this twenty-ninth day of September in the year of our Lord one thousand nine hundred and ninety-five.*

*Attest:*

*Commissioner*
*Plant Variety Protection Office*
*Agricultural Marketing Service*

*Secretary of Agriculture*

FORM APPROVED: OMB 0581-0055, Expires 1/31/91

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

# APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

*(Instructions on reverse)*

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) *(as it is to appear on the Certificate)*
Asgrow Seed Co.

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO.
XP4139

3. VARIETY NAME
A4539

4. ADDRESS *(street and no. or R.F.D. no., city, state, and ZIP)*
Asgrow Seed Co.
7000 Portage Road
9638-190-23
Kalamazoo, MI 49001

5. PHONE *(Include area code)*
1-616-384-2351

**FOR OFFICIAL USE ONLY**

PVPO NUMBER
9300149

FILING
Date: Mar. 02, 1995
Time: ☐ A.M. ☐ P.M.

FEES RECEIVED
Filing and Examination Fee: $2150.00 & $175.00
Date: 3/1/93, 3/30/93
Certificate Fee: $275.00 & $25.00
Date: 07/25/95 & 08/14/95

6. GENUS AND SPECIES NAME
Glycine max

7. FAMILY NAME *(Botanical)*
Leguminosae

8. CROP KIND NAME *(Common Name)*
Soybean

9. DATE OF DETERMINATION

10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*
Corporation

11. IF INCORPORATED, GIVE STATE OF INCORPORATION
Deleware

12. DATE OF INCORPORATION
March 22. 1968

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS
Wayne Hoener
Asgrow Seed Co.
7000 Portage Road
9638-190-23 Kalamazoo, MI 49001
PHONE *(Include area code)*:

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED *(Follow INSTRUCTIONS on reverse)*

a. [X] Exhibit A, Origin and Breeding History of the Variety.
b. [X] Exhibit B, Novelty Statement.
c. [X] Exhibit C, Objective Description of Variety.
d. [X] Exhibit D, Additional Description of Variety.
e. [X] Exhibit E, Statement of the Basis of Applicant's Ownership.
f. [X] Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office _____.
g. [X] Filing and Examination Fee ($2,150) made payable to "Treasurer of the United States."

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See section 83(a) of the Plant Variety Protection Act.)*
☐ YES *(If "YES," answer items 16 and 17 below)* ☒ NO *(If "NO," skip to item 18 below)*

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☐ YES ☐ NO

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?
☐ YES *(If "YES," through* ☐ Plant Variety Protection Act ☐ Patent Act. Give date: _____.)
☒ NO

19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?
☐ YES (If "YES," give names of countries and dates)
☒ NO

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

| SIGNATURE OF APPLICANT *(Owner(s))* | CAPACITY OR TITLE | DATE |
|---|---|---|
| Wayne L. Hoener | Soybean Prod. Mgr. | 2-18-93 |
| SIGNATURE OF APPLICANT *(Owner(s))* | CAPACITY OR TITLE | DATE |
| | | |

9300149

Asgrow Seed Company
PVP Application A4539 Soybean
February 15, 1993

**EXHIBIT A**

Origin and Breeding History of A4539

1985 - Cross was made at Isabela, Puerto Rico.

PARENTS: A4595 * A4009

1985-86 - F1,F2 and F3 generations grown at Isabela, Puerto Rico.

1986 - F4 generation grown at Stonington, Illinois. Several hundred plants were selected from the bulk population and threshed individually. Seeds from individual plants were screened in the greenhouse at Stonington, Illinois for resistance to race 3 of the soybean cyst nematode.

1987 - Progeny row IP85125-I87-23680 was selected for its appearance, standability and cyst nematode resistance at Stonington, Illinois. This row was harvested in bulk and seeds were checked and verified for uniform seed coat luster, hilum color and SCN resistance to race 3.

**It was October 1987, that IP85125-I87-23680 was determined to be a stable and unique line.**

1988 - IP85125-I87-23680 was entered in the preliminary P414 yield test (entry 26) which was grown at Stonington, Illinois and Queenstown, Maryland. It produced uniform stands and was selected for its high yield, good plant health and soybean cyst nematode resistance.

IP85125-I87-23680 was tested for soybean cyst nematode resistance during the winter of 1988-89 and found to be resistant to race 3.

1989 - Because of its good yield potential, IP85125-I87-23680 was put into the N403 (entry 39), an advanced yield trial for cyst resistant lines grown at nine non-cyst locations and three cyst-infested locations including the states of Maryland, Indiana, Illinois, Missouri and Kentucky. Because of its high yield and SCN resistance, it was selected and given the experimental designation X4139.

- X4139 was tested for phytopthora root rot resistance in the greenhouse and found to be susceptible. X4139 was checked to both race 3 and race 14 of the soybean cyst nematode by Asgrow personnel and found to be resistant to races 3 and moderate resistance to race 14.

continued ...

Exhibit A (A4539) continued.....

1990 - X4139 was grown in three different advanced trials during 1990 at twenty locations across the midwest and east coast and again yielded very well. X4139 was selected for its yield, standability, SCN resistance and brown stem rot tolerance and renamed XR4139.

XR4139 was again tested for phytopthora root rot resistance in the greenhouse and found to be susceptible. XR4139 was rechecked to both race 3 and race 14 of the soybean cyst nematode by Asgrow personnel and found to be resistant to race 3.

- Breeder seed of XR4139 was produced at Stonington, Illinois during the summer of 1990.

1991 - XR4139 was entered in three advanced yield trials which were grown at 16 locations across the midwest and east coast including the states of Illinois, Indiana, Kansas, Maryland, Missouri and Kentucky.

- XR4139 was tested by university personnel in the lab to the brown stem rot organism and found to be resistant.

- XP4139 again yielded well and was renamed XP4139 in the fall of 1991.

- XP4139 was again tested for phytopthora root rot resistance in the greenhouse and found to be susceptible. XP4139 was rechecked to both race 3 and race 14 of the soybean cyst nematode by Asgrow personnel and university personnel and found to be resistant to race 3 and moderately resistant to race 14.

- Basic seed stock of XP4139 was produced at Perry, Iowa while more breeder seed was grown at Stonington, Illinois.

1992 - XP4139 was entered in eight advanced yield trials which were grown at 16 locations across the midwest and east coast including the states of Illinois, Indiana, Kansas, Maryland, Missouri and Kentucky.

- XP4139 was again tested for phytopthora root rot resistance in the greenhouse and found to be susceptible. XP4139 was rechecked to both race 3 and race 14 of the soybean cyst nematode by Asgrow personnel and university personnel and found to be resistant to race 3 and moderately resistant to race 14.

- XP4139 again yielded well and was nominated for release and full production and assigned the designation A4539.

- Foundation and basic seed stock was produced at Matthews, Missouri.

A4539 is uniform and stable within commercially acceptable limits based on trial observations since its development in 1987. As with other soybean varieties, variants can occur for almost any characteristic during the course of repeated sexual reproduction.

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Asgrow Seed Company
PVP Application A4539 Soybean
February 15, 1993

EXHIBIT B

Novelty Statement concerning A4539 Soybean

To our knowledge the soybean varieties that most closely resemble A4539 are A4009, A4595, A4715 and Pioneer P9443. Characteristics which differentiate A4539 include, but are not necessarily restricted to the following:

| Variety | 1. Flower Color | 2. Pubescence Color | 3. Hilum Color | 4. Pod Wall Color | 5. SCN | 6. Peroxidase | 7. Charcoal Root Rot |
|---|---|---|---|---|---|---|---|
| A4539 | White | Tawny | Black | Tan | 3,14 | High | 3.5 |
| A4009 | White | Tawny | Black | Tan | 3,14 | High | --- |
| A4595 | White | Tawny | Black | Tan | None * | High | 4.7 |
| A4715 | White | Tawny | Black | Tan | 3,14 | High | 1.1 * |
| Pion 9443 | White | Tawny | Black | Tan | 3,14 | ---- | 5.0 |

| Variety | 8. Maturity | 9. Lodging | 10. Height | 11. % Protein | 12. % Oil | 13. Yield Bu/Ac. A4539 | Other |
|---|---|---|---|---|---|---|---|
| A4539 | 0 | 1.6 | 34" | 42.4 | 20.2 | ---- | ---- |
| A4009 | -2.8 * | 2.1 * | 37" | 42.5 | 20.4 | 60.7 | 56.3 (38 Loc.) |
| A4595 | +0.9 | 2.5 * | 39" | 41.8 | 20.2 | 61.1 | 58.5 (55 Loc.) |
| A4715 | +2.4 * | 1.7 | 37" | 42.0 | 20.5 | ---- | ---- |
| Pion 9443 | -5.4 * | 2.4 * | 34" | ---- | ---- | 63.4 | 56.8 (12 Loc.) |
| # Locations | 38 | 38 | 38 | 4 | 4 | | |

5.) Resistant to these races of Heterodera glycines Ichinohe, (soybean cyst nematode) (**note; race 14 was formerly race 4.)

7.) Charcoal Root Rot Resistance 1-5 : (1= No Disease, 5= All plants diseased)

8.) Days earlier (-) or later (+) than A4539.

9.) Lodging 1-5 : ( 1= No Lodging, 5= All plants flat)

10.) Height in inches.

13.) Yield in Bushels per Acre.

FORM APPROVED: OMB NO. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, MEAT, GRAIN & SEED DIVISION
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MARYLAND 20705

EXHIBIT C
*(Soybean)*

# OBJECTIVE DESCRIPTION OF VARIETY
## *SOYBEAN (Glycine max L.)*

| NAME OF APPLICANT(S) | TEMPORARY DESIGNATION | VARIETY NAME |
|---|---|---|
| Asgrow Seed Company | XP4139 | A4539 |

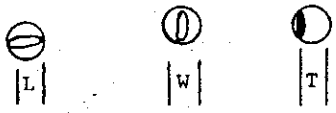
ADDRESS *(Street and No., or R.F.D. No., City, State, and Zip Code)*
7000 Portage Road
9638-190-23
Kalamazoo, MI 49001

FOR OFFICIAL USE ONLY
PVPO NUMBER
9300149

Choose the appropriate response which characterizes the variety in the features described below. When the number of significant digits in your answer is fewer than the number of boxes provided, place a zero in the first box when number is 9 or less (e.g., [0][9]). Starred characters ★ are considered fundamental to an adequate soybean variety description. Other characters should be described when information is available.

**1. SEED SHAPE:**

[2]




1 = Spherical (L/W, L/T, and T/W ratios = < 1.2)
2 = Spherical Flattened (L/W ratio > 1.2; L/T ratio = < 1.2)
3 = Elongate (L/T ratio > 1.2; T/W = < 1.2)
4 = Elongate Flattened (L/T ratio > 1.2; T/W > 1.2)

★ **2. SEED COAT COLOR: (Mature Seed)**

[1] 1 = Yellow 2 = Green 3 = Brown 4 = Black 5 = Other *(Specify)* _____

**3. SEED COAT LUSTER: (Mature Hand Shelled Seed)**

[1] 1 = Dull ('Corsoy 79'; 'Braxton') 2 = Shiny ('Nebsoy'; 'Gasoy 17')

★ **4. SEED SIZE: (Mature Seed)**

[1][6] Grams per 100 seeds

★ **5. HILUM COLOR: (Mature Seed)**

[6] 1 = Buff 2 = Yellow 3 = Brown 4 = Gray 5 = Imperfect Black 6 = Black 7 = Other *(Specify)* _____

★ **6. COTYLEDON COLOR: (Mature Seed)**

[1] 1 = Yellow 2 = Green

★ **7. SEED PROTEIN PEROXIDASE ACTIVITY:**

[2] 1 = Low 2 = High

★ **8. SEED PROTEIN ELECTROPHORETIC BAND:**

JSL 22 May 1995

[X1] 1 = Type A ($SP1^a$) 2 = Type B ($SP1^b$)

★ **9. HYPOCOTYL COLOR:**

[1] 1 = Green only ('Evans'; 'Davis') 2 = Green with bronze band below cotyledons ('Woodworth'; 'Tracy')
3 = Light Purple below cotyledons ('Beeson'; 'Pickett 71')
4 = Dark Purple extending to unifoliate leaves ('Hodgson'; 'Coker Hampton 266A')

★ **10. LEAFLET SHAPE:**

[3] 1 = Lanceolate 2 = Oval 3 = Ovate 4 = Other *(Specify)* _____

**11. LEAFLET SIZE:**

[2] 1 = Small ('Amsoy 71'; 'A5312') 2 = Medium ('Corsoy 79'; 'Gasoy 17') 3 = Large ('Crawford'; 'Tracy')

**12. LEAF COLOR:**

[2] 1 = Light Green ('Weber'; 'York') 2 = Medium Green ('Corsoy 79'; 'Braxton') 3 = Dark Green ('Gnome'; 'Tracy')

★ **13. FLOWER COLOR:**

[1] 1 = White 2 = Purple 3 = White with purple throat

★ **14. POD COLOR:**

[1] 1 = Tan 2 = Brown 3 = Black

★ **15. PLANT PUBESCENCE COLOR:**

[2] 1 = Gray 2 = Brown (Tawny)

**16. PLANT TYPES:**

[2] 1 = Slender ('Essex'; 'Amsoy 71') 2 = Intermediate ('Amcor'; 'Braxton') 3 = Bushy ('Gnome'; 'Govan')

★ **17. PLANT HABIT:**

[3] 1 = Determinate ('Gnome'; 'Braxton') 2 = Semi-Determinate ('Will') 3 = Indeterminate ('Nebsoy'; 'Improved Pelican')

★ **18. MATURITY GROUP:**

[0][7] 1 = 000 2 = 00 3 = 0 4 = I 5 = II 6 = III 7 = IV 8 = V 9 = VI 10 = VII 11 = VIII 12 = IX 13 = X

★ **19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)**

BACTERIAL DISEASES:

★ [0] Bacterial Pustule *(Xanthomonas phaseoli* var. *sojensis)*

★ [0] Bacterial Blight *(Pseudomonas glycinea)*

★ [0] Wildfire *(Pseudomonas tabaci)*

FUNGAL DISEASES:

★ [0] Brown Spot *(Septoria glycines)*

Frogeye Leaf Spot *(Cercospora sojina)*

★ [0] Race 1 [ ] Race 2 [ ] Race 3 [ ] Race 4 [ ] Race 5 [ ] Other *(Specify)* _____

[0] Target Spot *(Corynespora cassiicola)*

[0] Downy Mildew *(Peronospora trifoliorum* var. *manshurica)*

[0] Powdery Mildew *(Microsphaera diffusa)*

★ [2] Brown Stem Rot *(Cephalosporium gregatum)*

[0] Stem Canker *(Diaporthe phaseolorum* var. *caulivora)*



6

**19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant) (Continued)**

FUNGAL DISEASES: (Continued)

★ [0] Pod and Stem Blight *(Diaporthe phaseolorum* var; *sojae)*

[0] Purple Seed Stain *(Cercospora kikuchii)*

[0] Rhizoctonia Root Rot *(Rhizoctonia solani)*

Phytophthora Rot *(Phytophthora megasperma* var. *sojae)*

★ [1] Race 1 [1] Race 2 [1] Race 3 [1] Race 4 [1] Race 5 [0] Race 6 [1] Race 7

[1] Race 8 [0] Race 9 [ ] Other *(Specify)* rps

VIRAL DISEASES:

[0] Bud Blight (Tobacco Ringspot Virus)

[0] Yellow Mosaic (Bean Yellow Mosaic Virus)

★ [0] Cowpea Mosaic (Cowpea Chlorotic Virus)

[0] Pod Mottle (Bean Pod Mottle Virus)

★ [0] Seed Mottle (Soybean Mosaic Virus)

NEMATODE DISEASES:

Soybean Cyst Nematode *(Heterodera glycines)*

★ [0] Race 1 [0] Race 2 [2] Race 3 [0] Race 4 [2] Other *(Specify)* Race 14

[0] Lance Nematode *(Hoplolaimus Colombus)*

★ [0] Southern Root Knot Nematode *(Meloidogyne incognita)*

★ [0] Northern Root Knot Nematode *(Meloidogyne Hapla)*

[0] Peanut Root Knot Nematode *(Meloidogyne arenaria)*

[0] Reniform Nematode *(Rotylenchulus reniformis)*

[1] OTHER DISEASE NOT ON FORM *(Specify):* Charcoal Root Rot

**20. PHYSIOLOGICAL RESPONSES: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)**

★ [1] Iron Chlorosis on Calcareous Soil

[ ] Other *(Specify)* _____

**21. INSECT REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)**

[0] Mexican Bean Beetle *(Epilachna varivestis)*

[0] Potato Leaf Hopper *(Empoasca fabae)*

[ ] Other *(Specify)* _____

**22. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED.**

| CHARACTER | NAME OF VARIETY | CHARACTER | NAME OF VARIETY |
|---|---|---|---|
| Plant Shape | A4715 | Seed Coat Luster | A4009 |
| Leaf Shape | A4715 | Seed Size | A4009 |
| Leaf Color | A4715 | Seed Shape | A4009 |
| Leaf Size | A4715 | Seedling Pigmentation | A4009 |
| | | | |

23. GIVE DATA FOR SUBMITTED AND SIMILAR STANDARD VARIETY: Paired Comparison Data

| VARIETY | NO. OF DAYS MATURITY | PLANT LODGING SCORE | CM PLANT HEIGHT | LEAFLET SIZE | | SEED CONTENT | | SEED SIZE G/100 SEEDS | NO. SEEDS/ POD |
|---|---|---|---|---|---|---|---|---|---|
| | | | | CM Width | CM Length | % Protein | % Oil | | |
| A4539 Submitted A4539 | 146 | 1.5 | 87 | | | 42.4 | 20.2 | 15.9 | 3 |
| A4009 Name of Similar Variety | 143 | 2.1 | 93 | | | 42.5 | 20.4 | 16.3 | 3 |

**PUBLICATIONS USEFUL AS REFERENCE AIDS FOR COMPLETING THIS FORM:**


1. Caldwell, B.E., ed. 1973. Soybeans: Improvement, Production, and Uses. Amer. Soc. Agron. Monograph No. 16.
2. Buttery, B.R. and R.I. Buzzell. 1968. Peroxidase activity in seeds of soybean varieties. Crop Sci., 8: 722-725.
3. Hymowitz, T. 1973. Electrophoretic analysis of SBTI-$A_2$ in the USDA soybean germplasm collection. Crop Sci., 13: 420-421.
4. Payne, R.C. and L.F. Morris. 1976. Differentiation of soybean cultivars by seedling pigmentation patterns. J. Seed Technol. 1: 1-19.

9300149

Asgrow Seed Company
PVP Application A4539 Soybean
February 15, 1993

EXHIBIT D

Additional Description of the Variety

A4539 is a mid Maturity Group IV cultivar that possesses superior and consistent yields relative to other varieties of similar maturity. A4539 combines this high yield potential with resistance to races 3 of the soybean cyst nematode and moderate resistance to race 14. A4539 has also shown resistance to the brown stem rot organism.

9300149

Asgrow Seed Company
PVP Application A4539 Soybean
February 15, 1993

EXHIBIT E

Statement of the Basis of Applicant's Ownership

A4539 was originated and developed by Dale Weigelt, an Asgrow Plant Breeder. By agreement between employee and Asgrow Seed Company, all rights to any invention, discovery, or development made by an employee are assigned to the Company. No rights to such invention, discovery, or development are retained by the employee.